

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ZHIMIN HE, GUOXIAO GUO,
HUA QIAN and ENGHONG ONG

Appeal No. 2005-0661
Application No. 09/894,480

ON BRIEF

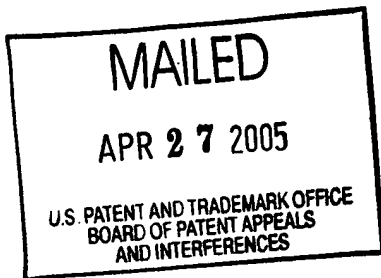
Before FRANKFORT, MCQUADE and NASE, Administrative Patent Judges.
MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Zhimin He et al. appeal from the final rejection of claims 1, 3 through 8, 10 through 15, 17, 19 and 20. Claims 2 and 9, the only other claims pending in the application, stand objected to as depending from rejected base claims.

THE INVENTION

The invention relates to "pivots for use with disc drive actuators" (specification, page 1). Representative claims 1 and



15 read as follows:¹

1. A disc drive comprising:

a housing having a first component;

an actuator having a cavity; and

a pivot comprising:

a first member positioned within the cavity and coupled to the actuator, the first member having at least one external surface;

a second member mounted to the first housing component; and

at least two leaves, each leaf joining one of the external surfaces to the second member, wherein the leaves are transversely disposed at an angle to one another such that the actuator is pivotable with respect to the housing about an axis.

15. A disc drive comprising:

a base;

an actuator configured for rotation relative to the base about an axis of rotation; and

means for pivotably coupling the actuator to the base.

THE PRIOR ART

The references relied on by the examiner to support the final rejection are:

Puro	4,478,532	Oct. 23, 1984
Ottesen et al. (Ottesen)	5,267,110	Nov. 30, 1993

¹ In the event of further prosecution before the examiner, steps should be taken to correct the lack of proper antecedent basis for the recitations of "the external surfaces" in claims 1, 6 and 13.

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Heath	6,205,005	Mar. 20, 2001
Rao	6,404,727	Jun. 11, 2002
Chin et al. (Chin)	6,424,503	Jul. 23, 2002

THE REJECTIONS

Claims 1, 3, 5, 6, 8, 10, 12, 13, 15, 17, 19 and 20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Heath.

Claims 4 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Heath in view of Rao and Puro.

Claims 5, 6, 12, 13 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Heath in view of Ottesen.

Claims 7 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Heath in view of Chin.

Attention is directed to the main and reply briefs (Paper Nos. 12 and 14) and answer (Paper No. 13) for the respective positions of the appellants and examiner regarding the merits of these rejections.

DISCUSSION

I. The anticipation rejection of claims 1, 3, 5, 6, 8, 10, 12, 13, 15, 17, 19 and 20

Anticipation is established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention. RCA Corp. v. Applied Digital Data Sys., Inc., 730 F.2d 1440, 1444, 221 USPQ

385, 388 (Fed. Cir. 1984). In other words, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. Scripps Clinic & Research Found. v. Genentech Inc., 927 F.2d 1565, 1576, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991).

The Heath reference pertains to pivot bearings for disk drive rotary actuators. The description of the embodiment shown in Figures 1 through 4 illustrates the basic nature of these bearings:

[i]n the example of FIGS. 1, 2, 3 and 4, the disk drive has a rectangular housing or base plate 1 supporting a disk 2 with a rotational axis 3. Fixed to the housing 1 is a pillar 4 with two spaced abutments 5. Each abutment has a part circular abutment face and the two abutments are spaced axially apart along a line parallel to the axis 3. A thin flexible plate 7 is attached along its two opposite edges extending parallel to the axis 3, at one side to the pillar 4 and at the other side to a region 8 of the rotary arm 9.

The head arm 9 has mounted on it a recording head 10 and a voice coil 11. The head arm 9 has a recess 12 in which is located the rolling member 17.

The rolling member 17 shown in FIG. 4 is in this example in the form of a relatively thick substantially rectangular plate having two spaced part circular abutments 18 separated by a cut away region 20 through which the flexible plate 7 passes. The plate 7 is as wide as reasonably fills the extent of the cut away portion 20 whilst not obstructing or contacting the member 17. The rolling member 17 has a part circular rolling surface 19 at its tip extending along its axial length on the side remote from the two spaced abutments 18. The rolling surface 19 engages in rolling engagement the lower surface of the recess 12 in the arm 9. The two abutments 18 engage respective abutments 5 on the pillar 4.

As shown in FIGS. 2 and 3, a spring 21 shaped similar to a letter C contacts a radiused surface 22 of the arm 9 and a similar radiused surface 23 of pillar 4. The spring is formed to exert an inward force on the arm 9 keeping the rolling member 17 held closely in abutment with both the pillar 4 and the base of the recess 12 in the arm. FIG. 2 shows that the spring 21 is formed with small flats 24 which are parallel when in contact with the radiused surfaces 22 and 23. When the angle of the arm 9 is such that the flexible plate 7 is in its unstressed flat form, the position of the radiused surfaces 22 and 23 are such that the line of action 25 exerted by the spring 21 passes directly through the points of abutment between the rocker member 17 both at its abutments 18 and its rolling surface 19.

The provision of the rocking member 17 with its rolling surface 19 engaging the arm 9 as well as the rolling contact with the abutments 5 avoids any slip between the abutting surfaces as the pivot arm rotates and flexes the plate 7.

In use, the arm assembly will rotate through a limited angular displacement as the abutments 18 roll around the abutments 5 on the pillar 4 thereby permitting the head 10 to move across the disk 2. During this movement the flexure plate 7 will deflect as shown in FIG. 3 but due to the rolling contact of surface 19 on the arm 9 . . . the flexing of the plate 7 is accommodated without causing any slipping between the abutting surfaces of the arm 9, pillar 4 and intermediate member 17. It is preferred that the curvature and dimensions of the intermediate member 17 are such as to permit pivoting or rolling movement between the member 17 and the arm 9 at approximately the centre of curvature of the rolling engagement between the member 17 and the pillar 4 [column 5, line 12, through column 6, line 13].

Heath also discloses an alternative embodiment, shown in Figures 17 and 18, wherein the actuator arm pivot or rocker assembly is provided as a separate unit:

[t]he rocker assembly for the actuator arm may be provided in a cartridge as shown in FIGS. 17 and 18. The cartridge assembly is formed as a separate unit 30 as shown in FIG. 18 and in this example is of generally cylindrical form. It is arranged to be a close fit in a circular aperture 33 in the actuator arm 9. Similar reference numerals have been used in FIGS. 17 and 18 as were used for corresponding parts of the embodiments shown in earlier Figures. The cartridge 30 has a part-circular body member 31 that fits closely against the wall of aperture 33 in the arm 9 and is fixed to rotate with the arm. A screw 39 passes through the arm 9 into a threaded hole 38 in the body 31 so as to secure the arm to the cartridge so that the arm 9 and body 31 move together as the arm rotates. The pillar 4 of the cartridge 30 is attached to the base 1 by means of a screw 36 which is housed in a counterbored hole 35 in the pillar 4 and screwed into the base 1. In this way the cartridge is secured to the base 1 with the pillar 4 held in a fixed position relative to the base 1. A part-circular retainer 32 forms a housing around the side of the cartridge remote from the body 31 and the body 31 and retainer 32 mate together to form a cylindrical cartridge fitting closely within the aperture 33. Both the body 31 and retainer 32 have shoulders 37 formed by a projecting flange at the lower end of the cartridge. Together they form a continuous shoulder which is close to the base 1 and a well defined distance from it. The lower surface of the arm 9 is biased onto contact with the shoulder 37 when assembled to ensure that the distance between the arm 9 and the base 1 is accurately defined. The spring 21 engages part-circular projections 22 and 23 in a manner similar to that already described with reference to earlier Figures [column 7, lines 27 through 57].

In applying Heath against the appealed claims, the examiner focuses on the disk drive embodiment shown in Figures 17 and 18 as understood in light of the disk drive embodiment depicted in Figures 1 through 4.

As framed and argued by the appellants, the dispositive issue with respect to the anticipation rejection of independent claims 1, 8 and 15 is whether Heath meets the limitations in claims 1 and 8 requiring the pivot leaves to be "transversely disposed at an angle to one another," and the limitation in claim 15 requiring the "means for pivotably coupling the actuator to the base." The examiner's determination that Heath responds to these limitations rests on a finding that Heath's flexible plate 7 and spring 21 constitute leaves which are transversely disposed at an angle to one another. Although claim 15 does not literally recite "leaves," let alone leaves that are "transversely disposed at an angle to one another," the examiner recognizes that the "means for pivotably coupling the actuator to the base" language in the claim is a means-plus-function limitation which must be construed in accordance with 35 U.S.C. § 112, sixth paragraph, to cover the corresponding structure described in the specification and equivalents thereof. In the examiner's view,

Heath is an equivalent of the means set forth in claim 15 in that the prior art to Heath performs the identical function specified in the claim (pivotably coupling the actuator to the base) in substantially the same way (by providing leaves that are transversely disposed) while producing the same results (pivoting the actuator about an axis) [answer, page 8].

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That Heath's flexible plate 7 and spring 21 embody "leaves" is not disputed. As for whether these elements are "transversely disposed at an angle to one another," the appellants submit that

the broadest interpretation of the term "transverse" requires that the elements cross one another. See, e.g., The American Heritage College Dictionary 1438 (3d ed. 1993) ("Situating or lying across; crosswise"). Heath's elements 7, 21 clearly do not cross one another [main brief, page 4].

The examiner, while not directly challenging the appellants' definition of "transverse," counters that "[s]ince the leaves [7 and 21] of the [Heath] pivot are not disposed in parallel, they must be transversely disposed at an angle to one another" (answer, page 6).

During patent examination, the USPTO applies to claim verbiage the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the specification. In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). The ordinary meaning of claim terms may be established by dictionary definitions. CCS Fitness Inc. v. Brunswick Corp., 288 F.3d 1359, 1366, 62 USPQ2d 1658, 1662 (Fed. Cir. 2002).

On the record before us, the unchallenged dictionary definition advanced by the appellants ostensibly represents the ordinary and accustomed meaning of "transverse" as it would be understood within the context of the appellants' invention. This dictionary definition also conforms with, and accurately describes, the crossing interrelationship of the leaves disclosed in the appellants' specification. In contrast, the examiner has failed to advance any authority for the rather dubious proposition that elements not disposed in parallel necessarily are transversely disposed at an angle to one another. As clearly shown in Heath's Figures 2 and 3, flexible plate 7 and spring 21 do not intersect or lie across one another from any reasonable perspective. Thus, a person of ordinary skill in the art would not view these elements as leaves which are transversely disposed at an angle to one another. Hence, the examiner's determination that Heath is anticipatory with respect to the subject matter recited in claims 1, 8 and 15 is unsound.

Accordingly, we shall not sustain the standing 35 U.S.C. § 102(e) rejection of independent claims 1, 8 and 15, and dependent claims 3, 5, 6, 10, 12, 13, 17, 19 and 20, as being anticipated by Heath.

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II. The obviousness rejections of claims 4 through 7, 11 through 14 and 17

As the examiner's application of Rao, Puro, Ottesen and/or Chin does not cure the foregoing deficiencies of Heath relative the subject matter recited in parent claims 1, 8 and 15, we also shall not sustain the standing 35 U.S.C. § 103(a) rejection of dependent claims 4 and 11 as being unpatentable over Heath in view of Rao and Puro, the standing 35 U.S.C. § 103(a) rejection of dependent claims 5, 6, 12, 13 and 17 as being unpatentable over Heath in view of Ottesen, or the standing 35 U.S.C. § 103(a) rejection of dependent claims 7 and 14 as being unpatentable over Heath in view of Chin.

SUMMARY


The decision of the examiner to reject claims 1, 3 through 8, 10 through 15, 17, 19 and 20 is reversed.

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REVERSED


Charles E. Frankfort

CHARLES E. FRANKFORT
Administrative Patent Judge


JOHN P. MCQUADE
Administrative Patent J

JOHN P. MCQUADE
Administrative Patent Judge

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